Amendments to the Claims

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims

1. (original)   A particle analyzer, comprising:

a particle concentrator adapted to collect and concentrate particles found within an aerosol;

a sample collection surface adapted to accept particles provided by the particle concentrator;

an energy source that provides energy that is adapted to induce fluorescence in the particles held by the sample collection surface; and

a detector adapted to detect the induced fluorescence.

2. (original)   The particle analyzer of claim 1, further comprising a substrate adapted to mount the sample collection surface.

3. (original)   The particle analyzer of claim 2, wherein the sample collection surface is at least partially thermally isolated from the substrate.

4. (original)   The particle analyzer of claim 3, further comprising temperature modifying means thermally coupled to the sample collection surface.

5. (original)   The particle analyzer of claim 4, wherein the temperature modifying means comprises heating means.

6. (original)   The particle analyzer of claim 4, wherein the temperature modifying means comprises cooling means.

7. (original)   The particle analyzer of claim 1, wherein the particle concentrator is adapted to provide mass sorted particles to the sample collection surface.

8. (original)   The particle analyzer of claim 1, wherein the sample collection surface comprises an adsorbate.

9. (original)   The particle analyzer of claim 1, wherein the sample collection surface comprises carbon nanotubes.

10. (original)  The particle analyzer of claim 1, wherein the energy source provides energy that induces at least some excitation fluorescence in a material of interest.

11. (original)  The particle analyzer of claim 1, further comprising an energy source lens adapted to direct the energy from the energy source to at least a portion of sample collection surface.

12. (original)  The particle analyzer of claim 1, wherein the detector is adapted and configured to detect excitation fluorescence while being at least substantially blind to reflective energy from the energy source.

13. (original)  The particle analyzer of claim 1, wherein the detector is adapted and configured to detect excitation fluorescence while being positioned at an angle relative to the sample collection surface such that reflective energy from the energy source does not impinge upon the detector.

14. (original)  The particle analyzer of claim 1, further comprising a detection lens adapted to focus induced fluorescence on the detector.

15. (original) The particle analyzer of claim 1, wherein the detector is sensitive to a plurality of wavelengths.

16. (original) The particle analyzer of claim 1, wherein the detector comprises an array of pixels.

17. (original) The particle analyzer of claim 16, wherein at least some of the pixels of the array of pixels are sensitive to a plurality of wavelengths, and are configured to provide a spatially resolved image.

18. (original) The particle analyzer of claim 16, wherein at least some of the pixels of the array of pixels are sensitive to a single wavelength band.

19. (original) The particle analyzer of claim 1, wherein the detector comprises a plurality of pixels sensitive to ultraviolet light and a plurality of pixels sensitive to visible light.

20. (original) The particle analyzer of claim 19, wherein the plurality of pixels sensitive to ultraviolet light are arranged in a first linear array and the plurality of pixels sensitive to visible light are arranged in a second linear array.

21. (original) The particle analyzer of claim 19, wherein at least some of the pixels sensitive to ultraviolet light and at least some of the pixels sensitive to visible light are positioned in an array in pair-wise fashion.

22. (original) The particle analyzer of claim 1, further comprising a controller that is configured to control operation of the energy source and the detector.

23. (original) The particle analyzer of claim 22, wherein the controller is further configured to control a temperature modifying means that is thermally coupled to the sample collection surface in accordance with a programmed or programmable temperature profile.

24. (original) The particle analyzer of claim 1 further comprising a humidity controller for controlling the humidity level around the sample collection surface.

25. (previously presented)    The particle analyzer of claim 1 further comprising a pH controller for controlling the pH level at the sample collection surface.

26. (original) The particle analyzer of claim 1 further comprising a chemical controller for selectively adding one or more chemicals to the sample collection surface.

27. (previously presented) A particle analyzer device, comprising:
a substrate;
a sample collection surface disposed over the substrate for collecting particles provided to the particle analyzer device; and
temperature adjusting means thermally coupled to the sample collection surface for adjusting the temperature of the sample collection surface.

28. (original) The particle analyzer device of claim 27, wherein the sample collection surface is at least partially thermally isolated from the substrate.

29. (original) The particle analyzer device of claim 27, wherein the substrate includes a cavity, and the sample collection surface is at least partially suspended over the cavity.

30. (original) The particle analyzer device of claim 29, further comprising a support member at least partially suspended over the cavity, where the sample collection surface is disposed on the support member.

31. (original) The particle analyzer device of claim 30, wherein the support member comprises one or more legs connecting the support member to the substrate.

32. (original) The particle analyzer device of claim 30, wherein the temperature adjusting means is disposed adjacent to or within the support member.

33. (previously presented)   The particle analyzer device of claim 29, wherein the substrate comprises a silicon wafer.

34. (original) The particle analyzer device of claim 27, wherein the temperature adjusting means comprises a resistive heater.

35. (original) The particle analyzer device of claim 27, wherein the temperature adjusting means comprises a thermoelectric cooling element.

36. (original) The particle analyzer device of claim 27, wherein the sample collection surface comprises an adsorbate.

37. (original) The particle analyzer device of claim 27, wherein the sample collection surface comprises carbon nanotubes.

38-63.  (canceled)

64.  (new)     A particle analyzer, comprising:
a particle concentrator adapted to collect and concentrate particles found within an aerosol;
a sample collection surface adapted to accept particles provided by the particle concentrator;

a substrate adapted to mount the sample collection surface, the sample collection surface being at least partially thermally isolated from the substrate;

an energy source that provides energy that is adapted to induce fluorescence in the particles held by the sample collection surface; and

a detector adapted to detect the induced fluorescence.

65. (new)    The particle analyzer of claim 64, further comprising temperature modifying means thermally coupled to the sample collection surface.

66. (new)    The particle analyzer of claim 65, wherein the temperature modifying means comprises heating means.

67. (new)    The particle analyzer of claim 65, wherein the temperature modifying means comprises cooling means.

68. (new)    The particle analyzer of claim 65, wherein the energy source provides energy that induces at least some excitation fluorescence in a material of interest.

69. (new)    The particle analyzer of claim 65, wherein the detector is adapted and configured to detect excitation fluorescence while being at least substantially blind to reflective energy from the energy source.

70. (new)    The particle analyzer of claim 65, wherein the detector is adapted and configured to detect excitation fluorescence while being positioned at an angle relative to the sample collection surface such that reflective energy from the energy source does not impinge upon the detector.

71. (new)    The particle analyzer of claim 65, wherein the detector is sensitive to a plurality of wavelengths.

72. (new)    A particle analyzer, comprising:

a particle concentrator adapted to collect and concentrate particles found within an aerosol;

a sample collection surface adapted to accept particles provided by the particle concentrator, the sample collection surface comprising carbon nanotubes;

an energy source that provides energy that is adapted to induce fluorescence in the particles held by the sample collection surface; and

a detector adapted to detect the induced fluorescence.


73. (new)    A particle analyzer, comprising:

a particle concentrator adapted to collect and concentrate particles found within an aerosol;

a sample collection surface adapted to accept particles provided by the particle concentrator;

an energy source that provides energy that is adapted to induce fluorescence in the particles held by the sample collection surface;

an energy source lens adapted to direct the energy from the energy source to at least a portion of the sample collection surface; and

a detector adapted to detect the induced fluorescence.


74. (new)    A particle analyzer, comprising:

a particle concentrator adapted to collect and concentrate particles found within an aerosol;

a sample collection surface adapted to accept particles provided by the particle concentrator;

an energy source that provides energy that is adapted to induce fluorescence in the particles held by the sample collection surface;

a detector adapted to detect the induced fluorescence; and

a detection lens adapted to focus induced fluorescence on the detector.

75. (new)    A particle analyzer, comprising:

a particle concentrator adapted to collect and concentrate particles found within an aerosol;

a sample collection surface adapted to accept particles provided by the particle concentrator;

an energy source that provides energy that is adapted to induce fluorescence in the particles held by the sample collection surface; and

a detector adapted to detect the induced fluorescence, the detector comprising an array of pixels.

76. (new)    The particle analyzer of claim 75, wherein at least some of the pixels of the array of pixels are sensitive to a plurality of wavelengths, and are configured to provide a spatially resolved image.

77. (new)    The particle analyzer of claim 75, wherein at least some of the pixels of the array of pixels are sensitive to a single wavelength band.

78. (new)    A particle analyzer, comprising:

a particle concentrator adapted to collect and concentrate particles found within an aerosol;

a sample collection surface adapted to accept particles provided by the particle concentrator;

an energy source that provides energy that is adapted to induce fluorescence in the particles held by the sample collection surface; and

a detector adapted to detect the induced fluorescence, wherein the detector includes a plurality of pixels sensitive to ultraviolet light and a plurality of pixels sensitive to visible light.

79. (new)     The particle analyzer of claim 78, wherein the plurality of pixels sensitive to ultraviolet light are arranged in a first linear array and the plurality of pixels sensitive to visible light are arranged in a second linear array.

80. (new)     The particle analyzer of claim 78, wherein at least some of the pixels sensitive to ultraviolet light and at least some of the pixels sensitive to visible light are positioned in an array in pair-wise fashion.

81. (new)     A particle analyzer, comprising:

a particle concentrator adapted to collect and concentrate particles found within an aerosol;

a sample collection surface adapted to accept particles provided by the particle concentrator;

an energy source that provides energy that is adapted to induce fluorescence in the particles held by the sample collection surface;

a detector adapted to detect the induced fluorescence; and

a controller that is configured to control operation of the energy source and the detector;

wherein the controller is further configured to control a temperature modifying means that is thermally coupled to the sample collection surface in accordance with a programmed or programmable temperature profile.

82.     (new)  A particle analyzer, comprising:

a particle concentrator adapted to collect and concentrate particles found within an aerosol;

a sample collection surface adapted to accept particles provided by the particle concentrator;

an energy source that provides energy that is adapted to induce fluorescence in the particles held by the sample collection surface;

a detector adapted to detect the induced fluorescence; and

a humidity controller for controlling the humidity level around the sample collection surface.

83.     (new)  A particle analyzer, comprising:

a particle concentrator adapted to collect and concentrate particles found within an aerosol;

a sample collection surface adapted to accept particles provided by the particle concentrator;

an energy source that provides energy that is adapted to induce fluorescence in the particles held by the sample collection surface;

a detector adapted to detect the induced fluorescence; and

a pH controller for controlling the pH level at the sample collection surface.

84.  (new)     The particle analyzer of claim 83, further comprising a chemical controller for selectively adding one or more chemicals to the sample collection surface.